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ABSTRACT

The curriculum recommendations of the Advisory Commission on Articulation Between Secondary Schools and Ohio Colleges are presented, along with the recommendations of the Advisory Council for College Preparatory Education. The recommendations for college preparatory science programs include the laboratory experiences and scientific vocabulary, as well as specific coursework in earth science, biology, chemistry, and physics. Recommendations for social studies programs cover goals for students of history, American history, American government, comparative government, social sciences, world history, and current events. The recommendations for foreign language study concern both modern and classical languages and specifically consider grammar and syntax, vocabulary, listening, speaking, reading, writing, and culture. Recommendations for English address specific writing skills, language, grammar, sentence and paragraph structure, writing organization, and reading skills. Finally, the recommendations for mathematics outline minimum requirements and topics that should be covered in algebra, geometry, trigonometry, analytic geometry, probability and statistics, along with computer program requirements. The members of each subject area task force are identified. (SW)

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November 8, 1982

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Preface

The 15-member Advisory Commission on Articulation Between Secondary Education and Ohio Colleges was jointly appointed by the State Board of Education and the Ohio Board of Regents on September 26, 1980.

The Advisory Commission was charged with the task of developing a college preparatory curriculum that would clearly reflect collegiate expectations for entering students, and, when followed, would reduce the need for remedial course work at the collegiate level.

The Advisory Commission recognized that a number of students are leaving high school unprepared for collegiate level work. Although courses are in place in most high schools, students may choose not to take them realizing that college entrance is not contingent upon courses taken. Lack of motivation, poor study skills, misunderstanding of college requirements and late decisions to attend college all contribute to students being ill-prepared academically.

The purpose of this document is to present under one cover the Advisory Commission's curriculum recommendations and those of the Advisory Council for College Preparatory Education, appointed in 1981, to implement the original recommendations. It is important that these skills be considered by district personnel when developing courses of study that will ensure that students planning to pursue their education beyond high school will have the opportunity to acquire the academic background that will prepare them for post-secondary education.

In addition, school counselors should familiarize themselves with the recommended curricula so that they may appropriately advise students who are planning to pursue higher education.

Ohio, through the work of the Advisory Commission on Articulation Between Secondary Schools and Ohio Colleges and the Advisory Council on College Preparatory Education, has gained national recognition for efforts to assure that students planning to pursue higher education are prepared to do so. All members are to be commended for these efforts.

Recommendations for College Preparatory Science Programs In High School

In a time when the advances of science and technology greatly influence the lives of each of us, scientific literacy becomes even more crucial for the college-bound student. Such literacy, in the view of the Task Force, is premised upon the student's competence in basic mathematics and language skills, such as those described by the Task Forces on Mathematics and English. The Task Force on Science strongly endorses those reports and encourages students to become well grounded in the topics they describe. Many students who think they are having trouble with science are, instead, having trouble with mathematics—trouble which could be avoided by taking a complete college-preparatory program in mathematics in high school.

The Task Force believes that when the study of mathematics features practical applications, as it can in science courses, the student's skills will be strengthened significantly. Achieving this level of integrated learning requires close coordination between mathematics and science teachers.

Before outlining the scientific coursework expectations for college-bound students, the Task Force wishes to comment on areas which may help students to be successful in such coursework.

An Effective Approach to Scientific Study

Natural science is based on observation, experimentation and measurement. Scientists, like good detectives, learn to understand the unusual pattern of the subject. When the pattern is changed, either by design or chance, the scientist will recognize the change and look for clues for its cause.

An inquisitive attitude and open mind are of great benefit to the science student. It is important to be aware of one's surroundings. Sensitivity to the world opens the mind to options previously not considered. When students are provided with the opportunity to pursue science as *inquiry*, and not as a series of exercises, they are likely to show significantly more interest and understanding.

Learning to synthesize scientific ideas through the solving of problems will be the focus of collegiate-level science courses. The Task Force encourages students to move beyond mere memorization of scientific facts to the utilization of the facts in the development of an analytical approach to scientific concepts. Introduction and practice in this mode should begin in high school.

Beyond possessing the qualities of curiosity, open-mindedness, and analytical thinking, the student of science should be objective, logical, and somewhat skeptical in analysis of information. The Task Force encourages students to learn to live with ambiguity while trying to reach scientific conclusions. Getting the "right answer" may be less critical than learning to ask the right questions.

The following basic skills, extracted by J.J. Gallagher from those identified by the National Assessment of Educational Progress in Science,[1] comprise a helpful index of key abilities for successful science students. A good high school preparation should enable a student to:

- Read scientific magazines, books, and other materials;
- Identify and define a scientific problem;
- Suggest or recognize a scientific hypothesis;
- Prepare or select validating statements;
- Obtain and interpret required data;
- Check the logic of a hypothesis with relevant facts, laws, and observations;
- Reason quantitatively and symbolically;
- Distinguish facts from hypothesis and opinion;
- Distinguish relevant from irrelevant models;
- Apply scientific principles and laws to familiar and unfamiliar situations.

In addition, the Task Force believes a good science program will provide students with:

- Knowledge of laboratory procedures and safety;
- An exposure to a wide variety of phenomena;
- A grasp of the size and magnitude of things associated with the study of various phenomena;
- An understanding of MKS (Meter/Kilogram/Seconds) units of mechanics;
- The ability to perform order of magnitude calculations;
- The ability to perform an uncertainty analysis of experimental results.

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[1] *James Joseph Gallagher, "Basic Skills* Common to Science and Mathematics," *School Science and Mathematics* 79 (1979): 555.

The Task Force believes that an effective approach to scientific study which prepares students to perform these skills must have a strong foundation in the elementary grades.

The Task Force also recognizes and supports the use of computers as a tool for instruction in the sciences. However, computer simulation is no substitute for field studies and laboratory experiences.

Laboratory Experiences

It is the opinion of the Task Force that laboratory experiences are vital to the student's understanding of science and its methods. The student should have laboratory experiences that reinforce his or her skills in observation, measurement, quantification, and estimation. Students should produce coherent laboratory reports that incorporate proper grammar and spelling.

Science laboratories should provide both exploratory and investigative activities, including field trips for the students. As arenas of discovery, laboratories may and should generate more thoughtful questions than absolute answers. This should more readily occur if the laboratory experience is one in which the students actively participate rather than passively observe demonstrations.

Therefore, the Task Force encourages the use of laboratory courses at both the collegiate and secondary levels. Students without such an experience are akin to cooks who do nothing beyond reading the recipe.

Scientific Vocabulary

In science, as in other disciplines, there exists a vocabulary which facilitates students' study. In the fields of earth science, biology, chemistry, and physics, there are key sets of words which are used by the scientific community. The Task Force urges teachers to help their students become comfortable in the use of vocabularies found in their texts.

Teachers also should reinforce other reading skills needed to comprehend scientific materials. Students need to understand, too, that scientific literature is normally written in a compact style. Therefore, a student should not expect to read a science text as rapidly as a novel.

CURRICULAR RECOMMENDATIONS

Emphasizing that the foregoing is as vital to the successful study of science as is the specific curriculum, the Task Force makes the following recommendations:

1. All college-preparatory students should take a minimum of three years of high school science. The courses should include at least two units from among laboratory courses in earth science, biology, chemistry, and physics. (Laboratory courses are defined as having 160 hours of instruction, at least 40 of which should consist of an active laboratory experience.)
2. Students who intend to pursue a baccalaureate degree in scientific fields should take four years of science to include biology, chemistry, and physics plus an advanced course, seminar, or research topic using an analytical approach in one science area. Advanced courses should not be taken until the above basic sequence has been studied.
3. All courses should include laboratory experience.
4. Science courses should serve as vehicles for the use and development of communication (i.e., reading, writing, and vocabulary development) and mathematical skills, while emphasizing observation, data collection and analysis, reasoning and critical thinking. As part of this effort, students should learn such skills as sequencing, making comparisons, and differentiating between facts and opinions.

In the experience of the Task Force, students should benefit from the following sequence (which assumes that life science has been taken in the middle school):

Earth Science	-	7th, 8th, or 9th grade
Biology	-	9th or 10th grade
Chemistry	-	10th or 11th grade
Physics	-	11th or 12th grade

The rationale for recommendation of this sequence of courses is linked to the student's study of mathematics. Earth science can be effectively taught in the eighth or ninth grades. Biology is among the most descriptive of science courses and builds on the student's study of life science. Chemistry is more quantitative and requires the mathematics which students should have by 11th grade. Finally, physics is highly quantitative and students will need as much mathematics as possible before taking it.

The Task Force recognizes that other models can be employed to achieve the same goals. Some schools may prefer the unified science model, which emphasizes teaching science as a consolidated whole rather than as a series of separate subjects. Other districts may prefer an interdisciplinary model in which science is taught in conjunction with one or more other disciplines. Lastly, it should be noted that gifted students may best progress with models that are entirely different, depending on their needs and rate of development.

SPECIFIC SCIENTIFIC COURSEWORK

Because approved high school courses of study in science are thorough in their listing of major topics and because the Task Force recognizes that the traditional topics are included, the coursework cited below is general. Within each specific course are themes that college-bound students should know. The study of science in the Task Force's view involves a broad introduction to basic concepts in the elementary years. In high school, those same concepts are reintroduced along with scientific methodology. In college, more depth is given to each of the areas defined in earlier work. It is, therefore, a higher priority that the high school student receive a *comprehensive overview* in each science course, rather than an in-depth focus on any one aspect of it.

It is the opinion of the Task Force that in each of the courses emphasis should be placed on laboratory safety. In addition, students should be knowledgeable of the applications of science to everyday life and should be aware of the career possibilities in the sciences.

Earth Science

The college preparatory course in earth science should build on the student's elementary school introduction to the natural environment. As an integrated course featuring a wide range of the scientific disciplines, earth science can help the student learn the basic principles of the physical sciences, the usefulness of mathematics, and the stimulation of the laboratory experience.

Students of earth science should achieve a basic understanding of time, space, motion, forces, energy, and matter. Principles related to these topics should be understood as well as generalizations derived from them.

Suggested topics for earth science study are listed below. The list is not comprehensive, but is designed to provide examples of focuses for earth science coursework.

1. *Scale*, with emphasis on topics such as atoms, minerals, maps, the solar system and stars, that help develop a perception of relative size.
2. *Energy*, with emphasis on heat transfer, heat of fusion, heat of vaporization, potential and kinetic energy, specific heat of a variety of substances, and other topics necessary to the study of weather and climate on earth.
3. *Distance and time*, with emphasis on the Earth's position in space, motion of the solar system, and stars and galaxies through time.
4. *Ecology*, with emphasis on man's impact on natural systems.
5. *Natural processes*, with emphasis on erosion, deposition, variations in solar isolations, soil characteristics, energy transfer, stream flow and the formation of minerals.
6. *Universality of change*, with emphasis on observing changes in surroundings, such as weathering of rock and concrete and the passage of seasons.

In addition, the student should be familiar with data collection methods and have an understanding of how we know what we know. For example, the collection of global geological knowledge beginning with continental drift, followed by seafloor spreading and, most recently, plate tectonics can be used to illustrate data collection on a large scale.

Students should be encouraged to make predictions based on observation. Studies of the apparent motion of the sun, soil characteristics, weather, and energy reserves readily provide data on which students can make predictions.

Biology

For the high school student of biology, emphasis should be placed on an *overview* of the characteristics of living organisms. Where possible, examples based on human beings should be used.

Students should have an understanding of:

1. *Atoms and molecules characteristic of life*, with emphasis on symbols for elements and general structure of carbohydrates, proteins, and lipids;
2. *Structure and function of cells*, with emphasis on cell diversity at the light microscope level and a general survey of the functions of organelles;
3. *Metabolism*, with emphasis on a *general* treatment of chemical and energy transformations including respiration and photosynthesis;
4. *Organs and organ systems of plants and animals*, with emphasis on an overview of organ anatomy and a general treatment of functions of each;
5. *Heredity*, with emphasis on Mendelian genetics with an overview of the functions of DNA and RNA;
6. *Reproduction*, with emphasis on the human and an overview of diversity of reproductive strategies,
7. *Development*, with emphasis on an overview of patterns of differentiation;

8. *Diversity of living things*, with an emphasis on an overview of characteristics of plants, animals and microbes at the level of phylum or equivalent taxon;
9. *Ecological Principles*
   a. *Populations*, with emphasis on factors that influence population size;
   b. *Communities*, with emphasis on the variety and types of communities and the process of succession;
   c. *Ecosystems*, with emphasis on cycling of matter and energy;
10. *Evolution*, with emphasis on evidences for evolution, current theories and the significance of evolution as a unifying concept.

Chemistry

The college preparatory courses in chemistry should introduce the student to the following areas of basic knowledge:

1. *The metric system*, with emphasis on the use of conversion factors in calculations and the expression of results with appropriate number of significant figures.
2. *The mole concept*, with emphasis on the calculation of the number of atoms, ions, formula units or molecules in a given mass of a substance and vice versa.
3. *Stoichiometry*, with emphasis on balancing simple equations and deriving conversion factors for use in stoichiometric calculations.
4. *Thermochemistry*, with emphasis on the relationships of heat, temperature and specific heat of substance.
5. *Electron configurations*, with emphasis on related periodic relationships such as metallic character, atomic radii, electronegativity and ionization potential.
6. *Bonding*, with emphasis on writing Lewis structures for ionic and covalent substances.
7. *Intermolecular forces*, with emphasis on how those forces influence the physical properties of a substance.
8. *Solubility*, with emphasis on concentration units and the distinction between strong and weak electrolytes.
9. *Rates and equilibria of reactions*, with emphasis on the qualitative effects of temperature, pressure, concentration and catalysts.
10. *Acids and bases*, with emphasis on neutralization reactions, pH calculations and relative strengths.
11. *Oxidation-reduction reactions*, with emphasis on identifying oxidizing and reducing agents with equations.

The stimulation of a chemical laboratory experience is an absolute requirement for an appreciation of chemistry as an experimental science. In addition to qualitative experiments on the preparation of substances and observation of their properties, the laboratory should include a few quantitative experiments such as titration.

The state law mandating the wearing of safety glasses should be enforced at all times.

Physics

The high school student of physics should have familiarity with:

1. *Physical phenomena*, gained by observing, measuring, and experimenting with them in a laboratory;
2. *Basic concepts of classical physics and quantum phenomena*, and the ability to use these concepts in the solution of practical problems.

These aspects of physics appear in physics instruction at the elementary grades on up to the graduate level. The differences among the levels lie mainly in the depth to which the various aspects are pursued, and in the sophistication of the mathematical treatments.

The following list reflects topics that ordinarily would be treated in physics at the high school level and in greater depth at the collegiate level. This list is not intended to prescribe a detailed curriculum. However, an understanding of such basic topics will be helpful in preparing the student for college level work.

It should be noted that for students who wish to pursue a career in engineering or in physical sciences, it is essential that the physics be supported by a level of mathematical skills which goes *at least* up to calculus, and which, ideally, includes calculus.

Finally, it is much more important for students to understand and to know how to use the material they have been taught than to be exposed to a great variety of things for which they have no practical use.

The Task Force does recommend the following basic topics in classical and quantum physics:

1. *Mechanics*, displacement, speed, velocity, acceleration, mass, momentum, conservation of momentum, force, work, power, potential and kinetic energy, conservation of energy;
2. *Vibrations and waves*, pendulum, simple harmonic motion, waves, sound, Doppler effect;
3. *Optics*, geometrical optics: rays, reflection, refraction; physical optics: interference, diffraction, polarization;

4. *Thermodynamics*, concepts of heat and temperature, heat transfer, conduction, convection, radiation, specific heat, calorimetry, kinetic theory of gasses, First and Second Laws of Thermodynamics, entropy;
5. *Electricity and magnetism*, electric charges, electric fields and potentials, capacitance, current, power, simple circuits. Magnetic properties of materials, magnetic fields, magnetic induction, inductance, electromagnetic waves;
6. *Quantum physics*, atoms and their structure, electrons, nuclei, protons, neutrons, other "elementary particles," quantum interactions of matter and radiation.

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Recommendations for College Preparatory Social Studies Programs in High School

The Task Force on Social Studies offers its recommendations for the preparation of high school students for college-level social science courses with the goal of clarifying for students how they may best ground themselves in academic social studies experiences which will assist them in college. Recognizing the value of social studies for all students, however, the Task Force supports education for civic responsibility as a basic and inherent goal of the social studies curriculum. Social studies programs at the secondary school level should combine student acquisition of knowledge with an understanding of and participation in the instructions of a democratic society and a free enterprise system.

Because of this basic purpose, the social studies curriculum[1] should provide not only the emphasis on topics discussed in detail in the course descriptions, but also deal with helping the student:

- Relate the fundamental beliefs drawn from the Declaration of Independence, Constitution and Bill of Rights to his or her understanding of contemporary society and to his or her development of personal attitudes regarding citizenship;
- Develop a world view which recognizes diversity among human beings and their ways of living.

The Task Force believes that in addition to educating for civic responsibility, it is very important for social studies to encourage students to develop crucial learning skills and proper learning attitudes in high school. Such skills and attitudes are basic to achievement in collegiate social science courses, just as they are in other coursework.

Learning Skills

An effective approach to social studies begins with skills and practice in basic reading, writing and mathematics at the high school level. The recommendations of the Task Forces on English and Mathematics are strongly endorsed by the Task Force on Social Studies. Of basic importance to the high school student of social studies is learning that how one formulates questions in the study of history is different from how one formulates questions in the social sciences. It is very helpful for the college-bound student to have an exposure to the various kinds of evidence that are used to make assertions in each of these fields of study. In the view of the Task Force, the student should be able to do the following:

- Demonstrate grasp of basic historical research skills through the completion of writing assignments which make use of both primary and secondary sources;
- Have some acquaintance with social science research and the method of inquiry found in most social science disciplines;
- Objectively analyze and evaluate data and hypotheses;
- Read and be able to identify the thesis in an argument; and
- Discuss logically what one has read. More specifically, students should be able to discuss issues of social or political concern which are not part of their own personal experiences.

Beyond the above crucial abilities, the Task Force believes the following study skills are important. Students would benefit from being able to:

- Understand and use the basic vocabulary of social studies courses;
- Listen to lectures in social studies courses and take appropriate notes; (The taking of notes is so integral to collegiate success that students' note-taking should be evaluated periodically.)
- Write essay examinations under time pressure, exhibiting logic and perception in theme development.

Attitudes Toward Learning

In the Task Force's view, social studies skills are skills for life. Coursework in the social studies should help students better understand their relationship to past human experience and the nature and structure of society that they share with others. Achieving such understanding requires a positive attitude toward learning and in particular an eagerness to understand human experiences and the factors affecting the ways humans organize themselves in social units.

With faculty guidance, the collegiate student is expected to assume responsibility for his or her own learning. College-bound high school students should adopt such responsibility early.

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[1] Social studies coursework prevalent in Ohio is identified in Tables 6 and 7 of "Social Studies in Ohio Secondary Schools," Ohio Department of Education, Columbus, Ohio, 1981.
See Appendix.

Recommendations

The Task Force on Social Studies recommends a three-unit curriculum in the following sequence for college-bound students:

1. American History
2. American Government, and
   choice of:
   a. Comparative Government, or Problems of Democracy, or other coursework which builds on earlier foundations.

      or

   b. Specific Social Science (such as anthropology, economics, geography, phychology, or sociology)
3. World History

   The Task Force suggests world history be taken in the senior year.

Such recommendations are based on the assumption that students have taken Ohio history and geography in elementary or middle school and that map skills will be stressed throughout social studies courses at the secondary level.

The Task Force on Social Studies believes that its suggested sequence is a logical extension of pre-high school social studies curricula since it uses students' familiarity with more local events to introduce the increasingly complex issues and sweep of world history. Of all social studies courses, world history, in the opinion of the Task Force, demands the greatest level of maturity on the part of students. As a survey of all human experience, the course can quickly become a mind-boggling array of names, dates, and places, almost all of them outside the cultural experience and perspective of students at the sophomore level. Students at this age and level are not likely to be ready to assimilate the information given to them and to place it in any meaningful context.

By the time students are seniors, however, they will have had courses in Ohio history, in American history and other areas of the social studies, as well as courses in literature, science, and perhaps, the arts. All of these courses play a fundamental role in building a base for understanding human experience in its broadest dimensions.

Students who take the suggested curriculum will also have been exposed to a specific social studies discipline which should help them understand a method of inquiry different from that in history.

Goals for the Student of History

Students should develop:

- An understanding of their cultural heritage including its political, economic, social, intellectual, artistic and religious aspects;
- An appreciation for the tolerance of the existence of debate among experts about the nature of historical development and interpretation;
- An appreciation that history is more than a collection of facts, but rather a complex interaction of events, personalities, and circumstances filtered through the mind of a subjective interpreter;[2]
- Familiarity with major persons, movements and ideas in their proper chronological order as a basis for study in the social sciences at the collegiate level;
- Understanding of historical techniques and methods of inquiry, including the use of primary sources (such as autobiographies of statesmen) and secondary sources (such as journal articles, historical accounts and textbooks);
- An appreciation for the community of mankind and a sense of responsibility for that community's successes and failures;
- An awareness of the role that tradition and precedent have played in the evolution of ideas and institutions.

American History

The Task Force recommends that students:

- Learn basic factual data and the chronology of events in U.S. history and develop an awareness of the **significance** of such events as well as develop an ability to explain their significance;

  (The challenge for the social studies teacher at all levels is to help the student learn how to move from event to assessment of its significance.)
- Study the major events and movements in U.S. history as national history but try also to see them as related to events and movements outside American borders (for example, the peace movement, or the battle against slavery);
- Have exposure to and be able to discuss the ideas and themes found in high school U.S. history texts and as seen through the following major topics:
  - The Age of Exploration and the expansion of European civilization and values;

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[2] *The Task Force believes that predominant use of multiple choice exams can act to reinforce the fact-memorizing approach to social studies and, therefore, encourages use of reports, papers, essay examinations, and book reviews to encourage student intellectual development.*

- The continuing process of immigration and settlement throughout American history;
- Reasons for the coming of the American Revolution, the ways in which American revolutionary ideals clashed with social practices (e.g., freedom and slavery);
- The westward movement and its social implications;
- The Civil War, its causes and consequences;
- The impact of urbanization and industrialization upon American life;
- Expansion of American interests in the Western Hemisphere and beyond;
- American involvement in three worldwide events: World War I, the Great Depression, and World War II;
- The Cold War and after: the United States and the Soviet Union in conflict;
- The great political parties, their values, and how the parties have and do reflect major social currents of the day;
- The movement toward equality in American society, (e.g., in the civil rights and the feminist movements); and,
- The United States response to the challenge of revolution and nationalism.

American Government

The importance of the high school American government class is based on several significant considerations. As the college-bound student will discover, social science courses at the post-secondary level frequently deal with political issues, relationships, and institutions. Students enrolled in these courses will have a significant advantage if they already possess a firm understanding of the American political system. For many other students, American government is probably the only formal government or political science course they will ever take. If taken in the junior year, it would precede by one or two years the first opportunity students have for voting. If taken in the junior year, it would involve students who are relatively mature and motivated and who have already studied a year of American history.

Students of American government should develop:

- Skills needed for objectively analyzing political events;
- Knowledge about the democratic process, including some awareness of traditional American theories of democracy and their relationship to our system of government;
- An ability to think clearly about their own political beliefs and those of others;
- An understanding of the theory, structure, and functions of national, state, and local government in the United States, and how they interrelate. This should cover the judicial, legislative, and executive branches, including some study of governmental bureaucracy, as well as the important informal institutions of the American political system: political parties, interest groups, and the press;
- An understanding that contending points of view are a natural part of democratic politics.

Students who understand these aspects of American government should be prepared to take college-level courses on American government as well as courses on comparative government.

Comparative Government or Problems of Democracy Courses

Among the choices which college preparatory high school students should consider are the advanced courses in American government, including such classes as problems of American democracy. Students' understanding should be built on the work of the basic course in American government, and focused on the workings of the different levels of government.

Students should:

- Learn about the meaning of democracy, exploring such concepts as political participation or civil liberties;
- Understand that politics revolve around powerful contending interests and ideas.

Social Science Courses

The Task Force recommends that high school students study one specific area of social science (other than political science) in preparation for college. The importance of such a course lies with introducing the student to the method of inquiry prevalent in the social sciences. Courses such as economics, psychology, sociology and others can provide a basis for insight into the methods of inquiry employed by the social sciences.

- Become acquainted with social science methods of inquiry including observation, quantification, statistical and computer analysis, interviewing and survey research;
- Develop an awareness that the social sciences are centrally concerned with analyzing human experience and organization, but that each discipline is interested in asking different questions about the human experience.

World History

Although there can be an almost infinite variety of topics suitable for a world history course, the Task Force supports the concept that the teaching emphasis be upon the development of western societies, and upon developments since 1700. There will be adequate time and opportunity in college for students to take specialized coursework on non-Western cultures. A better appreciation of these cultures will occur when students have a sound understanding of their own heritage.

In many instances, the pressure of time in high school coursework leaves a knowledge gap for college-bound students, usually from World War II to the present. Therefore, the Task Force suggests that topics in Area I be given an overview, that topics in Area II receive more emphasis, and that the most emphasis be placed upon subjects in Area III.

Students should be able to identify the major points of significance of:

Area I

Mesopotamian Civilization
Near Eastern Monotheism
Greek City States
Roman Republic and Empire
Early Christianity
Middle Ages
Feudalism/Manorialism
Byzantine Empire and Islam
Nationalism/Nation State
Crusades

Students should be able to recognize and discuss the importance of:

Area II

Renaissance
Reformation
Dynastic Warfare
Absolutism
Old Regime
Enlightenment
French Revolution and Napoleon
Romanticism
19th Century Revolution and Reform

Students should be able to trace the impact and compare developments over time in the following areas:

Area III

Industrial Revolution and the Rise of Capitalism/Urbanization
Imperialism and the Expansionism of the West
World War I and the Breakdown of the Old World Order
Communism
Fascism and Coming of World War II
World War II
The Cold War
Emerging Nations and the Problems of Development
The Growing Interrelatedness of the World Economy

A world history course with these emphases will give students a substantial base for understanding larger world developments and will therefore prepare students to take a wide variety of history courses at the college level.

Current Events Courses

The Task Force notes that many students schedule courses listed under the general rubric of current events or contemporary problems. The Task Force recognizes that students can benefit from such courses if they are thoroughly grounded in a disciplinary perspective. Current events students should become acquainted not only with sources of information about contemporary issues, but also begin to develop judgment about the worthiness of such sources.

The Task Force believes that such courses ought to be taken only by students who have first completed at least two of the three units in the recommended social studies curriculum. Without such background, current problems courses may be taken by students who have little perspective on human experience.

Summary

In summary, being well grounded in the basic coursework previously outlined is, in the Task Force's view, the best way a student can prepare for successful college work in history and the social sciences.

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APPENDIX
TO
RECOMMENDATIONS
FOR COLLEGE PREPARATORY
SOCIAL STUDIES
PROGRAMS IN HIGH SCHOOL

"Social Studies in Ohio Secondary Schools"
Ohio Department of Education
Columbus, Ohio 1981

TABLE 6

PERCENTAGE OF RESPONDENTS INDICATING COURSE TITLES WITHIN VARIOUS SOCIAL SCIENCE DISCIPLINES

Social Science Discipline	Percentage of Schools Offering Courses in the Discipline	Rank
Anthropology	7.0	9
Economics	57.0	6
Geography	66.4	5
Government	100.0	1
History	99.2	2
Philosophy	2.3	10
Psychology	70.9	4
Sociology	73.4	3
Interdisciplinary	19.5	8
Others	40.9	7

"Social Studies in Ohio Secondary Education"
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TABLE 7

NUMBER OF TITLES OF SOCIAL STUDIES COURSES WITHIN SPECIFIED SOCIAL SCIENCE AREAS AND RANK OF DISCIPLINE BY NUMBER OF TITLES

Social Science Discipline	Number of Titles	Most Frequent Title	Rank
Anthropology	4	Physical/Cultural Anthropology World Cultures	9
Economics	16	Consumer Economics	7.5
Geography	26	World Geography	5
Government	64	American Government	2
History	136	World History	1
Philosophy	2	Religion	10
Sociology	16	Sociology	7.5
Interdisciplinary	38	American Problems Current Events Contempory World Affairs	4
Others	54	Current Events	3

Recommendations for College Preparatory Foreign Language Programs in High School

Those who are interested in foreign languages education in Ohio have long worked together across the levels of secondary and higher education to encourage the strong academic preparation of students. The members of the Foreign Language Task Force wish to acknowledge the work done by the Ohio Modern Language Teachers Association's Committee on Curriculum and Articulation. The Committee's work provided a significant basis for substantive discussion.

Initial Consideration

The Task Force on Foreign Language concurs with the findings of the 1979 President's Commission on Foreign Languages and International Studies. The Commission report describes the lack of foreign language competence as a national liability that increasingly handicaps our capacity to understand and to participate effectively in world affairs. Such practical disadvantages in the field of international relations are grave enough by themselves. But such considerations are reinforced by the increasingly international nature of business and industry today. To compete effectively in the foreign marketplace will require greater language facility than most Americans currently possess. In addition, a return to basic foreign language requirements at the collegiate level reflects a concern with strengthening language preparation and a conviction that the study of foreign language contributes to student understanding and use of English.

The value of foreign language study for all students lies in its development of a disciplined understanding of the underlying rationale and structure of a communication system that has differences from their own. Grasping the harmony, balance, and symmetry among words in the exploration of another linguistic order is closely akin to the intellectual exercise gained from study of sciences. The ability to analyze language is the linguist's qualitative analogue to the chemist's quantitative analysis.

But foreign language learning is also a humanistic pursuit. In the words of the President's commission report, "language study must sensitize students to other cultures, to the relativity of values, to appreciation of similarities among peoples and respect for the differences among them . . . It is axiomatic—and the first step to international consciousness—," the report asserts, "that once another language is mastered it is no longer foreign, once another culture is understood it is no longer alien."

An effective approach to language study

The Task Force believes that in order to ensure adequate preparation for college, secondary school instruction in modern foreign languages should focus on listening, speaking, reading, and writing as active and receptive means to participation in another culture. Students should be firmly grounded in the basic grammar and syntax of the language being studied while developing their ability to converse, to understand the discourse of others and finally, to express their thoughts in written form in another language.

The Task Force sees the study of foreign languages as a means to humanistic as well as skill-building and career ends. Secondary students should develop an understanding of the historical and modern cultural context of the countries where the language is used. Such experience should indirectly prepare them more fully for the social studies they encounter at the collegiate level. In the Task Force's view, language study should serve as an integrating force for collegiate study in general, rather than merely leading to additional foreign language coursework. At the same time, it should lead students to a greater awareness of career areas today where proficiency in a foreign language is a necessity or a strong asset.

Two years of foreign language study should enable students to develop sufficient control of vocabulary, grammar, and syntax, together with the learning skills and confidence necessary to approach successfully the faster tempo of language study at the collegiate level. The average student who has taken two years of a single foreign language should be ready for the pace of collegiate coursework. The strong student may, with two years of study, achieve a degree of equivalency for collegiate-level work through a proficiency or placement examination. However, the strong student who has taken three or more years of a foreign language in high school is far more likely to fulfill collegiate language requirements through examination. The Advisory Council for College Preparatory Education, therefore, recommends that students complete at least two years of a single foreign language.

In addition, the Advisory Council for College Preparatory Education recommends that students carefully consider the following options:

- At least three years of study in a single foreign language for those who plan to pursue a

college major which will require language facility.

- Two years of study in two different languages to broaden one's understanding of common elements of language structure and use for those who find language study of personal interest.

More specifically, the Task Force recommends that students demonstrate the following competencies:

MODERN LANGUAGES

Grammar and Syntax:

A. Following two years of study, the student:
- Understands and can use main elements of grammar and syntax as found in any widely adopted introductory foreign language text series;
- Uses simple grammatical structures for oral and written communication;
- Recognizes more complex grammatical constructions when listening and reading.

B. Following three or more years of study, the student:
- Maintains practice and can use with ease the elements of grammar and syntax introduced throughout his or her years of language study.

Vocabulary

A. Following two years of study, the student:
- Has active control (speaking and writing) of a minimum vocabulary of approximately 1500-2000 terms which are representative of those found in the glossary of any widely adopted foreign language textbook series;
- Has receptive (listening and reading) control of a minimum vocabulary of approximately 2500-3000 terms;
- Infers meaning of new words belonging to known word families.

B. Following three or more years of study, the student:
- Has acquired additional vocabulary from a variety of sources (e.g., newspapers, literary texts, magazines, radio broadcasts, movies, and so on).

Listening

A. Following two years of study, the student:
- Comprehends simple utterances spoken at a moderate tempo;
- Recognizes differences between formal and familiar forms of address;
- Distinguishes questions from statements in all forms commonly used by speakers of the foreign language;
- Infers the meaning of new words from context;
- Comprehends textbook-related materials presented at a normal tempo;
- Understands simple anecdotes, narrative and dramatic passages spoken at a moderate tempo.

B. Following three or more years of study, the student:
- Understands more complex narrative and dramatic passages spoken at an appropriate tempo;
- Adjusts to a variety of voices, tempos, and standard accents;
- Follows authentic spoken language of various types (e.g., drama, speeches, radio, TV, films).

Speaking

A. Following two years of study, the student:
- Speaks with sufficient clarity to be understood by native speakers of the foreign language;
- Uses appropriate accent, rhythm, intonation and stress in simple declarative and interrogative sentences;
- Speaks in the foreign language on topics within the range of the student's experience, including the expression of personal opinions or ideas;
- Summarizes in the foreign language a simple narrative or dramatic passage that has just been read aloud;
- Uses formal and familiar forms of address appropriately and with facility.

B. Following three or more years of study, the student:
- Retells simple narratives using appropriate changes in person and/or tense;
- Displays conversational fluency with appropriate selection of words and phrases (including idioms) and with acceptable control of grammar, syntax and phonology;
- Discusses current events;

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[1] The following is based on "Proposed Foreign Language Curriculum Guide for the State of Ohio," prepared by Richard and Mary Danner of Ohio University for the Articulation and Curriculum Committee of the Ohio Modern Language Teachers Association. It was edited by the Task Force on Foreign Language for use here.

- Discusses the main features of literary works.

Reading

A. Following two years of study, the student:
   - Reads simple textbook-related paragraphs with full comprehension;
   - Infers the meaning of new words from context;
   - Comprehends simple contemporary readings (expository and literary) with the aid of a dictionary or glosses.

B. Following three or more years of study, the student:
   - Comprehends selected literary materials with minimal aid of a dictionary or glosses;
   - Comprehends expository prose (e.g., magazines, newspapers, history, geography, politics) of an introductory or non-specialist nature with minimal aid of dictionary or glosses.

Writing

A. Following two years of study, the student:
   - Uses diacritical marks, spells, capitalizes, and punctuates correctly,
   - Reproduces with accuracy dictated materials from textbooks;
   - Answers simple questions in writing;
   - Rewrites dialogue using indirect disclosure;
   - Summarizes brief expository passages;
   - Writes simple personal letters;
   - Composes short paragraphs using a variety of vocabulary and syntactical patterns.

B. Following three years or more of study, the student:
   - Writes with correct basic grammar and syntax;
   - Composes short answers to essay questions;
   - Composes brief dialogues and narratives;
   - Expresses opinions on a wide range of topics;
   - Organizes ideas well within paragraphs and in whole compositions.

Culture

A. Following two years of study, the student:
   - Recognizes and can compare basic cultural similarities and differences between countries in which the language is spoken and the United States;
   - Recognizes that people throughout the world are individuals;
   - Reflects an objective view of foreign culture.

B. Following three or more years of study, the student:
   - Demonstrates, in foreign language, knowledge of the foreign culture (geographical, social political, religious, artistic, and economic aspects).

C. The foreign language program should encourage acquaintance with the foreign culture in ways such as:
   - Recommending and facilitating study abroad in a country or countries where the language being studied is spoken;
   - Encouraging participation in foreign exchange programs;
   - Participating in local ethnic activities;
   - Attending and/or sponsoring language fairs.

CLASSICAL LANGUAGES

Grammar and Syntax

A. Following two years of study, the student:
   - Understands and can use main elements of grammar and syntax as found in any widely adopted introductory foreign language text series (this would include 5 declensions, 4 conjunctions, active and passive voices in all 6 tenses);
   - Usees simple grammatical structures for written communication;
   - Recognizes more complex grammatical constructions when reading.

B. Following three or more years of study, the student:
   - Maintains practice and can use with ease the elements of grammar and syntax introduced throughout his or her years of language study.

Vocabulary

A. Following two years of study, the student:
   - Has active control of a minimum vocabulary of approximately 1500-2000 terms which are representative of those found in the glossary of any widely adopted foreign language textbook series;
   - Has receptive control of a minimum vocabulary of approximately 2500-3000 terms;
   - Infers meaning of new words belonging to known word families;
   - Uses Latin or Greek clauses to define complex English terms.

B. Considerable emphasis should be placed on the comparative study of English and the classical language, with particular attention to word derivation and vocabulary building through prefixes and suffixes. Following three years of study, the student:
   - Recognizes Latin expressions in spoken English;
   - Explains commonly used classical allusions (e.g., Achilles' heel, sword of Damocles).

Reading

A. Following two years of study, the student:
   - Reads simple classical language text aloud, using proper intonation, pronunciation, and phrasing;
   - Reads simple textbook-related paragraphs with full comprehension;
   - Infers the meaning of new words from context;
   - Comprehends simple contemporary readings (expository and literary) with aid of a dictionary or glosses.

B. Following three years or more of study, the student:
   - Reads aloud, with proper intonation, pronunciation, and phrasing, selections of prose (e.g., Cicero's orations) and poetry (e.g., Vergil's *Aeneiddactylic* hexameter);
   - Comprehends selected literary materials with minimal aid of a dictionary or glosses;
   - Comprehends expository prose of an introductory or nonspecialist nature with minimal aid of dictionary or glosses.

Writing

A. Following two years of study, the student:
   - Uses diacritical marks, spells, capitalizes, and punctuates correctly;
   - Reproduces with accuracy dictated materials from textbooks;
   - Answers simple questions in writing;
   - Rewrites dialogue using indirect disclosure;
   - Writes simple personal letters;
   - Composes short paragraphs using a variety of vocabulary and syntactical patterns.

B. Following three years of study, the student:
   - Writes with correct basic grammar and syntax;
   - Composes short answers to essay questions;
   - Composes brief dialogues and narratives;
   - Expresses opinions on a wide range of topics;
   - Organizes ideas well within paragraphs and in whole compositions;
   - Identifies and gives examples of basic rhetorical devices;
   - Scans dactylic hexameter.

Culture

A. Follwing two years of study, the student:
   - Recognizes and compares basic cultural similarities and differences between the classical world and the modern world;
   - Recognizes that people throughout the world are individuals;
   - Reflects an objective view of the classical culture.

B. Following three or more years of study, the student:
   - Presents in the foreign language broad knowledge of the classical culture (geographical, social, political, religious, artistic, and economic aspects);
   - Identifies main literary and historical contributions to American culture from classical origins, as well as major etymological contributions to the English language.

OTHER LANGUAGES

For the student with interest and opportunity, the study of languages such as those of Oriental, Middle Eastern or Russian origin may be challenging. Skill in these languages could be an asset for the foreign language student who has interest in what may be pivotal countries of the future.

INSTRUCTION

The Task Force supports the strengthening of cooperative efforts between secondary and collegiate level educators of foreign languages. Strengthening of foreign language instruction through better preparation at all points of teacher and faculty preparation is a worthy goal indeed.

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Recommendations for College Preparatory English Programs in High School

In response to its charge by the Commission on Articulation, the Task Force on English hereby submits its recommendations for the college preparatory curriculum in high school English. While doing so, it wishes to reaffirm that these recommendations are offered in a spirit of collegiality with the teachers of high school English. We are all committed to serving the educational needs of our students and to helping them achieve fluency, ease, and even joy in using their language.

The Task Force has focused the bulk of its energy on recommendations which define the *writing* skills necessary for collegiate entering freshmen. It is in that area that the widest gaps appear between collegiate expectations and high school preparation. This focus on writing is given to define more specifically collegiate composition expectations; it should not be seen as a suggestion to teach less literature, reading, or other language skills in high school.

Prior to offering these recommendations, the Task Force wishes to comment briefly on aspects of the nature of writing which affect the educational goals we all seek. They are process,

logic, organization, practice, attitude, and responsibility.

Process

In the view of the Task Force, writing is a non-linear, recursive process which circles from pre-writing, to writing, to reading, to revising and editing, to proof-reading, and 'round again. Final drafts are rarely produced at first sittings.

Logic

Desirable expository writing has logic as its core. It is clear and easy to read. Basic and unskilled writers benefit from understanding how induction from specific examples, deduction from generalizations, fallacies and distinctions between fact and judgment contribute to the accurate expression of thought.

Organization

The purpose for writing is directly related to audience and goal. The structure of a piece of writing should have purpose as its foundation. It is in this key area that many writers have difficulty.

Practice

Like any other skill, writing requires practice for competency. Language skills develop gradually, over time. Therefore, the development of desired writing and reading skills requires practicing these skills on a regular basis, over a considerable period of time, with regular instruction and evaluation by teachers.

It is the strong recommendation of the Task Force that college preparatory high school students write daily. Just as the music teacher does not need to listen to every practice, the English teacher does not need to grade every piece of writing. However, a reasonable sampling does need to be evaluated.

Attitude

A student's perception that he or she is *unable* to write often becomes a self-fulfilling prophecy. Writing can be an intensely personal expression of one's thoughts; comments on those thoughts need to be encouraging, motivating the student to hone his or her writing skills further. The evaluation of writing needs to be as individualized as possible.

Responsibility

Teaching the use of Edited American English in writing and Standard American English in speech is a responsibility to be shared by all teachers, and is not the sole responsibility of English teachers. Writing across the curriculum is crucial; where inservice courses are needed to achieve cross-disciplinary writing assignments, they should be offered.

The remainder of this report is divided into four sections: (I) Overall Definition of Expected Writing Skills; (II) Specific Writing Skills; (III) Reading Skills; (IV) Additional Elements of the College Preparatory Program in English.

(I) Overall Definition of Expected Writing Skills

The Collegiate Task Force on English expects the following writing skills of entering freshmen:

(A) The student writes in an hour a clearly-focused expository (informative, explanatory) essay of about three handwritten pages which has:
  (1) a clearly defined thesis;
  (2) clear and logical organization of ideas;
  (3) supporting details drawn from experience, observation, and/or reading;
  (4) standard paragraphs and sentences of Edited American English (the dialect and grammar used by educated writers of the language).

(B) The student uses standard marks of punctuation and standard spelling.

Mastery of these writing skills is valuable, in the Task Force's view, for several reasons: It prepares students to respond to essay examinations given under similar conditions in other college coursework, and it prepares students to produce written work under the pressure of limited time.

(II) Specific Writing Skills

The following description[2] of student writing skills focuses more specifically on collegiate expectations for entering freshmen. By meeting these expectations, students would be ready for freshman English and would avoid remedial coursework.

It would be difficult to provide a complete list of the prose features that typify satisfactory essays for students beginning freshman English composition. However, it is possible to identify certain key characteristics that regularly distinguish these essays from those of students who must do a great deal of catching up at the beginning of freshman composition or who need more writing practice to prepare them for freshman level writing. These key characteristics generally fall into five basic categories: *language, grammar and mechanics, sentence structure, paragraph structure,* and *essay organization.*

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[2] Prepared by Dr. Ronald Fortune of Ohio State University and edited by the Task Force on English for use here.

Language

In their diagnostic essays, students who are prepared for freshman English will use language that combines a sense of freedom with what one noted authority refers to simply as "a respect for language." That is, they will feel comfortable enough with language to experiment with it in order to find the best way to say what they mean and, at the same time, they will adhere to the conventions of standard English. They will be able to meet the following expectations about how language is used in their essays:

- The diction (choice of words that are correct, clear, and effective) in the essay is specific and original; the writers neither confuse the reader with vague terms nor depend on cliches to communicate ideas that have not been fully expressed. The writers present ideas honestly.
- A level of diction appropriate to the writers' purposes and sensitive to their readers' expectations is maintained throughout the essay. Thus, unless there is a good reason for using slang, it is avoided in an essay in which the reader is expecting a more formal treatment of the topic.
- Phrasing is economical; the writers use only as many words as are necessary to express their ideas. Simple, direct expression of ideas is evident.
- Diction is varied in order to keep prose from becoming repetitious and monotonous. The written vocabulary adequately describes the writers' ideas.

Grammar and Mechanics

The diagnostic essays of students suited to freshman English exhibit a thorough command of grammar and mechanics. The authors of these essays realize that a comma, for example, is not a meaningless mark on paper, but can enable readers to read a sentence with greater efficiency and easier understanding. These writers recognize that grammar and mechanics can be as important to the communication of an idea as the words used to express that idea. Their essays are relatively free of errors in grammar, mechanics, and usage.

The following assertions about grammar and mechanics should be evident in the essays of freshman English writers. They represent common concerns and are not an exhaustive list of grammatical issues.

- Every verb agrees in number with its subject in each of the sentences.
- The verb tenses are consistent and appropriate to the time scheme of the discussion.
- Each pronoun used agrees in number and gender with the noun to which it refers.
- Every modifier is clearly linked to the word, phrase, or clause that it modifies.
- Commas, semi-colons, and colons are correctly used to show how different parts of a sentence (especially introductory phrases, coordinate and subordinate clauses, nonrestrictive modifiers, and items in a series) are interrelated.
- Grammatical forms and punctuation correctly indicate possession.
- Special care has been taken to ensure that spelling is accurate.

Sentence Structure

In addition to using proper grammar and mechanics to tell a reader how a sentence can best be read, students equipped for work in freshman English are able to control their sentences so that the reader can understand their ideas most efficiently. Since sentences are the basic building blocks through which essays are constructed, the readability of an entire essay will depend greatly on how well-controlled its sentences are. Authors of satisfactory diagnostic essays in freshman English generally construct sentences exhibiting the following traits:

- Sentences are of a "digestible" length. They do not attempt to say too much. Material that should be distributed over several sentences is not forced into one.
- Sentences are grammatically complete and contain at least one independent clause with a subject and a verb.
- The main idea in a sentence is correctly placed in a prominent position. In this way, the reader always knows what point the writers want to emphasize.
- The writers use subordination, coordination, and parallel structures in their sentences to suggest how the parts of an idea are interrelated.
- Sentence length and sentence structure are varied in order to emphasize key ideas and to keep prose from becoming monotonous.

Paragraph Structure

Students who are ready to begin freshman English recognize that readers depend on paragraphing not only to help them see quickly the major subdivisions of an essay's controlling idea but also to enable them to focus on the development of each key supporting idea in the essay. These students know that certain principles must govern the relationship of a given paragraph to the rest of the essay and that another set of principles dictates the various plans by which paragraphs can be internally developed. Their awareness of both sets of principles is reflected in their ability to write paragraphs in the following ways:

- Each paragraph focuses on a single aspect of the essay's thesis, often expressing its focus explicitly in a sentence at or near the beginning of the paragraph.
- Each paragraph has a discernable plan for the logical development of the expressed focus. Every plan is based on a logical interaction between a focal generalization and supportive/illustrative/concrete details.
- The details by which a paragraph's generalization is developed are sufficiently articulated and analyzed to make the generalization comprehensible and convincing for a reader.
- All of the paragraphs in the essay are unified and coherent.
- Paragraph transitions are used to relate adjacent paragraphs clearly to one another.

Writing Organization

Students who are ready for freshman English generally understand how to give their writing an overall shape that includes a beginning, a middle, and an end. Knowing that a reader must realize a sense of purpose and direction at every point in an essay, they are careful to establish a main idea at the outset of an essay and to examine systematically and intricately the ideas on which the thesis is based in the rest of the paper. Their writing bears "outer shapes" which can be described by the following:

- The main idea is limited so that the writers are able to develop fully all of the key ideas that support it.
- The main idea is articulated clearly at or near the beginning of the essay. That idea is then developed in detail.
- Sub-topics are discussed in an order suited both to subject matter and to audience.
- The writers are careful throughout the essay to be sure that the reader will know how everything that is discussed is related to the essay's main idea.
- Every sub-topic in the essay is clearly relevant and necessary. At no point do the writers seem to be following a structural formula not suited to the subject matter.
- The writers regularly use transitional devices within and between the essay's subdivisions in order to make the logical progression of ideas apparent to a reader.

None of the characteristics listed here is alone enough to qualify an essay as satisfactory for a student starting out in freshman English. A reader expects that all of these characteristics are present in an essay. To the degree that they are not, that reader will become confused and frustrated. It also should be emphasized that these characteristics do not exhaust the definitive qualities of good writing. Rather, they describe the features of an essay that will be a solid basis from which students can begin to learn to write in freshman English at the collegiate level.

(III) Reading Skills

In addition to having certain writing skills upon entering freshman English, students also should be in command of the basic reading skills that will help them to develop as writers. Entering freshmen should be able to:

- Recognize the topic or thesis statement of a reading assignment.
- Paraphrase the argument and supporting statements of an essay.
- Analyze and evaluate the ways in which supporting ideas are developed in an essay.
- Relate the thesis and main ideas discerned in a reading assignment to a classroom discussion or writing assignment.

In the reading and writing assignments given in post-secondary freshman English, it is assumed that the student has at least a rudimentary grasp of these abilities.

(IV) Additional Elements of the College Preparatory Curriculum in English

In addition to the writing skills outlined above, the Collegiate Task Force recommends that the four-year college preparatory English curriculum include:

A. A survey of American literature (at least one semester; preferably one year).

B. A survey of English literature (at least one semester; preferably one year).

C. At least a brief study of Greek drama and Greek and Roman mythology, as well as Biblical materials which are the source of numerous allusions in the literature of the Western World.

D. Study of the key features of literature (character, plot, image, symbol, theme, point of view, structure). The focus should be on recognition and analysis of the key features, and understanding should be demonstrated through analytical writing about these elements.

E. Basic research processes and strategies. These activities should be designed to help students learn how to focus *their questions* (not teacher assigned questions) and to discover relevant answers through using information sources (libraries, card catalogues, basic indexes, and reference works). The students' work should show an integration of secondary materials with personal opinion. The Task Force believes the research process can be learned in a shortened format, rather than the traditional 5,000 word term paper.

F. Emphasis on reading throughout high school.

G. Listening and speaking skills as integral parts of the college preparatory curriculum. The Task Force views the language arts as a unified whole. Functional, transferable parallels of learning patterns exist between reading and writing, listening and speaking. The high school curriculum should expose students to these logical parallels and provide practice in them.

In summary, the Task Force offers these recommendations as a means whereby high school graduates will be academically ready for collegiate level English.

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Recommendations for College Preparatory Mathematics Programs in High School

The Collegiate Task Force on Mathematics, in response to its charge by the Commission on Articulation, hereby submits its recommendations for the college preparatory program in mathematics. It is offered in a spirit of cooperation with our colleagues who teach at the high school level. Our common goal is better preparation in mathematics for all Ohio students, particularly those intending to enter two-year and four-year colleges.

Recommendations

1. Students should begin the study of algebra after mastering the arithmetic and general mathematics skills outlined in Appendix D-II. (Provision should be made for a high school student to begin the study of algebra in any of the 4 years of high school.)
2. College preparatory students should take a minimum of 3 years of mathematics: Algebra I, Algebra II, and Geometry. (See Appendix D-III for course content recommendations.)
3. Students who intend to pursue a baccalaureate degree in fields requiring courses in collegiate calculus should take 4 years of high school mathematics. (See Appendix D-IV for recommended number of years of college preparatory mathematics for various college programs.)
4. One year of college preparatory mathematics should be taken in the senior year of high school.
5. Courses should emphasize problem solving and should grade students on their ability to solve problems correctly and display problem-solving processes in a clear stepwise fashion.
6. From the start of Algebra I and thereafter, students should have a hand-held scientific calculator for use as a tool in the learning of mathematics.
7. Each college preparatory mathematics course should culminate in a comprehensive examination.
8. At the end of the junior year of high school, the Ohio Board of Regents and the State Department of Education should jointly provide the opportunity for diagnostic mathematics testing which will indicate the individual student's achievement level relative to college entry standards. This measure (such as Ohio State's Early Mathematics Placement Test) should assist in the scheduling of appropriate senior year mathematics courses.
9. Calculus, where offered in the secondary schools, should be at least a full year course and be taken only by those students who are strongly prepared in algebra, geometry, trigonometry, and coordinate geometry. Additionally, the calculus course should be constructed so as to prepare the enrolled students to take the Advanced Placement Examination of the College Board.
10. While not *yet* essential to the college preparatory program, it is highly recommended that students acquire an understanding of the versatility and limitations of the computer through first hand experiences with applications in a variety of subject matter fields. (See Appendix D-V.)

In conclusion, the Task Force on Mathematics endorses the recommendations of the Mathematics Association of America and the National Council of Teachers of Mathematics (See Appendix D-VI.) It shares the serious concern of the National Science Foundation and the U.S. Department of Education which cites slippage in the importance attached to scientific and mathematical education in the United States while other industrialized countries are emphasizing these curricula.[3]

Required Skills

The following arithmetical skills should be mastered before the study of algebra is begun:

1. Computation with whole numbers, fractions, and decimals.
2. Applications of percent.
3. Translation of situations and verbal problems into mathematical statements.
4. Facility in rounding and approximation.
5. Understanding and use of basic arithmetic properties.
6. Efficient use of calculator.
7. Use and interpretation of graphs and tables.
8. Meaning of mean, mode, median.
9. Computation with exponents and square roots.

[3] National Science Foundation and U.S. Department of Education, "Report to the President of the United States: Science and Engineering Education for the 1980's and Beyond". Washington: October, 1980.

Minimum Requirements

Students preparing for two-year or four-year colleges need a minimum of 3 years of college preparatory mathematics: Algebra I, Geometry, and Algebra II. Many students need 4 years of college preparatory mathematics. The content of the recommended college preparatory courses is given below:

Two years of Algebra to include:

Simplification of algebraic expressions

Integer exponents

Fractional exponents and radicals

Absolute value and inequalities

Solution of linear equations and inequalities in one variable

Ratio, proportion, and variation

Products and factoring

Operations on polynomials

Complex numbers

Solution of quadratic equations by factoring, completing the square, using the quadratic formula

Solution of quadratic inequalities

Graphing linear and quadratic functions and inequalities, including the determination and interpretation of slopes

Solution of equations with rational expressions

Graphing rational functions

Solution of systems of linear equations (two equations in two unknowns, three equations in three unknowns)

Binomial theorem

Solution of polynomial equations

Arithmetic and geometric progressions

Exponential and logarithmic functions and equations

Analysis and solution of word problems (including estimation and approximation) shall be emphasized throughout the above sequence of topics.

Geometry:

Angles, parallel lines, congruent and similar triangles, circles and arcs, Pythagorean Theorem

Application of formulas for perimeters, areas, volumes, and surface areas

Basic postulates of Euclidean geometry; construction of proofs of geometric theorems

Experience in visualizing and drawing three-dimensional figures

Right triangle trigonometry

If course time remains, coordinate geometry and constructions.

The 4th year of college preparatory mathematics should contain a semester of trigonometry plus a semester of either analytic geometry or probability and statistics.

Trigonometry (One Semester):

Trigonometric functions as ratios of lengths of sides of triangles and as circular functions

Graphical characteristics of trigonometric functions

Solution of right triangles

Radian and degree angular measure

Trigonometric identities including double angle, half angle and addition formulas

Law of sines and cosines

Inverse trigonometric functions and their graphs

Solution of trigonometric equations

Trigonometric form of complex numbers and De Moivre's Theorem.

Analytic Geometry (One Semester):

Analytic Geometry, a traditional course in coordinate geometry including conic sections; rational functions and their graphs, polar coordinates, parametric equations and their graphs.

Probability and Statistics (One Semester):

Using topics as found in a typical statistics textbook:

Descriptive Statistics—frequency distributions

Means, medians, variance

Probability

Distributions: Binomonial, Normal, ...

Statistical Inference: Sampling distributions, confidence intervals, hypothesis testing

Regression and Correlation.

Recommended Courses

Listed below are the recommended number of years of college preparatory mathematics for various baccalaureate programs. Three years means Algebra I, Geometry, and Algebra II. Four years means Algebra I, Geometry, Algebra II, and a fourth year of either trigonometry/analytic geometry or trigonometry/probability and statistics.

Program	Recommended Years of College Preparatory Mathematics
Agriculture:	
— Agricultural economics	3
— Entomology	3
— Environmental sciences	4
— Food sciences	3
— Forestry	3
— Genetics	3
— Landscape architecture	3
— Plant pathology	3
— Rural sociology	3
— Wildlife ecology	3
— Other areas of agriculture	
Architecture	3
Art	3
Business:	
— Accounting	4
— Economics	4
— Management	4
Communications	3
Education:	
— Elementary	3
— Child Development and Preschool	3
Engineering	4
History	3
Language and Literature	3
Law	3
Life sciences:	
— Bacteriology	4
— Biochemistry	4
— Biology	4
Linguistics	3
Mathematical sciences:	
— Mathematics	4
— Statistics	4
— Actuarial sciences	4
— Computer science	4
Medicine:	
— Allied medicine	3
— Dental hygiene	3
— Dentistry	4
— Medical technology	4
— Nursing	3
— Optometry	4
— Physical therapy	3
— Pre-medicine	4
— Public health	3
Music	3
Pharmacy	4
Philosophy	3
Physical sciences:	
— Astronomy	4
— Chemistry	4
— Geology	4
— Physics	4
Social sciences:	
— Anthropology	3
— Asian studies	3
— Black studies	3
— Geography	3
— Political science	3
— Psychology	4
— Sociology	3
Theater	3

Computer Program Requirements

Programs designed to take full advantage of the multidisciplinary potential of computers should include the following:[4]

- Problem solving
- Simulations that give the opportunity to practice decision making
- Lessons that introduce and develop concepts
- Word processing to develop communication skills
- Data retrieval tasks such as career information services
- Simulation that replaces dangerous, expensive, or technically difficult laboratory work
- Programming
- Drill-and-practice programs
- Student-operated computer services within the community
- Teacher-support services
- Functions that improve the evaluation process.

[4] National Council of Teachers of Mathematics, "Computers in the Classroom" position statement, 1980.

RECOMMENDATIONS

The Board of Governors of the Mathematical Association of America and the Board of Directors of the National Council of Teachers of Mathematics make the following recommendations:

1. Proficiency in mathematics cannot be acquired without individual practice. We, therefore, endorse the common practice of making regular assignments to be completed outside of class. We recommend that parents encourage their children to set aside sufficient time each day to complete these assignments and that parents actively support the request of the teachers that homework be turned in. Students should be encouraged to develop good study habits in mathematics courses at all levels and should develop the ability to read mathematics.

2. Homework and drill are very important pedagogical tools used to help the students gain understanding as well as proficiency in the skills of arithmetic and algebra; but students should not be burdened with excessive or meaningless drill. We, therefore, recommend that teachers and authors of textbooks step up their search for interesting problems that provide the opportunity to apply these skills. We realize that this is a difficult task, but we believe that providing problems that reinforce manipulative skills as a byproduct should have high priority, especially those that show that mathematics helps solve problems in the real world.

3. We are aware that teachers must struggle to maintain standards of performance in courses at all levels from kindergarten through college and that serious grade inflation has been observed. An apparent growing trend to reward effort or attendance rather than achievement has been making it increasingly difficult for mathematics teachers to maintain standards. We recommend that mathematics departments review evaluation procedures to insure that grades reflect student achievement. Further, we urge administrators to support teachers in this endeavor.

4. In light of 3 above, we also recognize that advancement of students without appropriate achievement has a detrimental effect on the individual student and on the entire class. We, therefore, recommend that school districts make special provisions to assist students when deficiencies are first noted.

5. We recommend that cumulative evaluations be given throughout each course, as well as at its completion, to all students. We believe that the absence of cumulative evaluation promotes short-term. We strongly oppose the practice of exempting students from evaluations.

6. We recommend that computers and hand calculators be used in imaginative ways to reinforce learning and to motivate the student as proficiency in mathematics is gained. Calculators should be used to supplement rather than to supplant the study of necessary computational skills.

7. We recommend that colleges and universities administer placement examinations in mathematics prior to final registration to aid students in selecting appropriate college courses.

8. We encourage the continuation or initiation of joint meetings of college and secondary school mathematics instructors and counselors in order to improve communication concerning mathematics prerequisites for careers, preparation of students for collegiate mathematics courses, joint curriculum coordination, remedial programs in schools and colleges, an exchange of successful instructional strategies, planning of in-service programs, and other related topics.

9. Schools should frequently review their mathematics curricula to see that they meet the needs of their students in preparing them for college mathematics. School districts that have not conducted a curriculum analysis recently should do so now, primarily to identify topics in the curriculum which could be either omitted or de-emphasized, if necessary, in order to provide sufficient time for the topics included in the above statement. We suggest that, for example, the following could be de-emphasized or omitted if now in the curriculum:

   (A) logarithmic calculations that can better be handled by calculators or computers.

   (B) extensive solving of triangles in trigonometry.

   (C) proofs of superfluous or trivial theorems in geometry.

10. We recommend that algebraic concepts and skills be incorporated wherever possible into geometry and other courses beyond algebra to help students retain these concepts and skills.

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